## The Effect of Changes to Nickel Coating Machine on Surface Integrity and Microstructure after Grinding

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Grinding is an overly used finishing technology, which can obtain very accurate surface integrity. The desirable surface quality after grinding is one of the most relevant parameters. In production, surface preparation such as chromium plating, nickel plating, etc. are more prevalent. These platings are used as protection against corrosion, erosion, abrasion and as a material for the renovation of worn parts. This paper discusses the change of nickel coating machines, which has an influence on surface integrity and microstructure after grinding. The team has built a completely unique and new technical solution for the covered equipment which had never been built in the past. The input parameters were selected based on past experience in the company, related to the area covered in this paper.

**Keywords:** nickel, grinding, surface integrity, microstructure

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## References

- [1] MASLOV, J., N., *Teorie broušení kovů*. Praha: SNTL Nakladatelství technické literatury, n. p., 1979. 244-248 s.
- [2] MÁDL, J., KAFKA, J., VRABEC, M., DVOŘÁK, R. Technologie obrábění, 3. díl. Praha: ČVUT, 2000. 81 s.
- [3] NOVÁK, M., HOLEŠOVSKÝ, F. *Studium integrity broušeného povrchu* [online]. [cit. 2014-2-28]. Dostupné z http://www.fvt.tuke.sk/journal/pdf08/2-str-11-13.pdf
- [4] MÁDL, J., HOLEŠOVSKÝ, F.: *Integrita obrobených povrchů z hlediska funkčních vlastností*, Miroslav Sláma, 1. vyd. Ústí nad Labem: UJEP, FVTM Ústí nad Labem, 2008, 230 s., ISBN 978-80-7414-095-2.
- [5] MALLORY, G. O. a J. B. HAJDU. *Electroless Plating Fundamentals and Applications*. Orlando: William Andrew Publishing/Noyes, 1990, 575 s. ISBN 978-0815512776.
- [6] MAREK, M., NOVAK, M. (2017). Process and Equipment Improvement for Nickel Brush Plating Application. In *Manufacturing Technology*, Vol. 17, No. 4, pp. 503-507.
- [7] MARINESCU, Z., D., aj. (2007). *Handbook of machining with grinding wheels*. Boca Raton: CRC Press.2007. 592 s. ISBN 1-57444-671-1
- [8] E. PENA-MUNOZ, Electrolytic and alectroless coatings of Ni-PTFE composites. *For Surface and Coatings Technology*. Volume 107 (1998), issues 2-3, pp. 85–93
- [9] M.R KALANTARY, K.A HOLBROOK, P.B WELLS, Trans. Instut. Metal Finishing, Volume 71 (1993), pp. 55
- [10] LATTNER R., HOLESOVSKY F., KAREL T., LATTNER M. (2015). Abrasive Machining of Ti6Al4V Alloy. In *Manufacturing Technology*, Vol. 15, No. 4, pp. 571 575.
- [11] LATTNER, R., HOLESOVSKY, F., NOVAK, M., VRABEL, M. (2016). Grinding of titanium Alloy Ti6Al4V with Silicon Carbide Grinding Wheel. In *Manufacturing Technology*, Vol. 16, No. 1, pp. 159 162
- [12] NOVAK, M., NAPRSTKOVA, N., (2015). Grinding of the Alloy INCONEL 718 and Final Rougness of the Surface and Material Share. In *Manufacturing Technology*, Vol. 15, No. 6, pp. 1015 1023
- [13] NOVAK, M. (2011) Surface quality of hardened steels after grinding. In: *Manufacturing Technology*, Vol. 11, No. 11, pp. 55-59

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